0426-19

1895 45 C

Malted 40
No. milling of grain
Grinds malted grain

RECORDED

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COMPLETE SPECIFICATION.

[Communicated from abroad by the Firm of C. A. Profft & Co., of 17-21, Arning Strasse, Hamburg, in the Empire of Germany, Manufacturers.]

Improvements in and relating to the Making of Bread.

I, Henry Harris Lake, of the Firm of Haseltine, Lake & Co., Patent Agents, 45 Southampton Buildings, in the County of Middlesex, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

The known process for the direct manufacture of dough from grain, in which the grain is used to form dough without undergoing the usual intermediate process of conversion into flour, is improved upon by the invention hereinafter described inasmuch as the grain is submitted to a germinating process or malting previously to being reduced to dough.

The far-reaching importance of this improvement will be apparent from the following consideration.

In the preparation of bread from flour, groats or grain from which the husks have been removed as hitherto carried out, the inherent nature of grain is not in the least taken into account; the grain is simply ground into flour and this latter baked into bread.

Each sound and perfect grain contains within itself latent life however which life can only be awakened by the presence of moisture. If therefore moisture is allowed to act in a suitable manner upon cleansed and washed grain, that is to say if the latter is caused to swell by means of fluid at an appropriate temperature, there commences in each grain, as soon as the moisture has penetrated to its inmost core, a new life; out of the valuable nitrogenous substances in the corn a ferment is formed (the so-called diastase) which possesses to a high degree the property of converting insoluble starch into soluble starch (dextrin) and this latter into sugar (maltose).

The soluble substance formed from the insoluble starch particles offers to the embyo the nutriment necessary for its development, and thereby the process which brewers term "malting" is begun. In brewing, the malting process is continued to such an extent as to extract from the grain, with the germs which are formed, substances which impart an injurious character to the beer. In this novel method of preparing dough or bread a malting likewise takes place, which can be carried on to any desired extent, but for practical reasons the germinating process should be checked at the right moment and at the most allowed to continue only until the tender radicles begin to be visible, and this not only in order that the bread may not acquire a bitter taste but also because a portion of the nutriment is extracted from the grain and consequently also from the bread if the operation is allowed to continue longer.

In brewing, the germinating process is stopped by withdrawing the moisture from the malt, drying it in kilns and thereby destroying the germ.

The method of preparing dough or bread according to this invention is essentially different. In carrying out this process such a quantity of moisture (water,

milk or the like) must be brought into contact with and retained by the grain as is necessary to produce germination and to prepare the dough. When sufficient germination or malting has taken place the grain passes to the reducing machine, in which the germ is destroyed by crushing the malted grain and the germinating process is arrested.

During the reduction of the malted grain so as to form dough suitable for baking an increased action of the diastase takes place owing to the intimate grinding of the same in a suitable machine or mill. When it is considered that the diastase has been sufficiently stimulated in the grain, its further action may be allowed to continue in the dough.

The conversion of the insoluble starch flour into sugar which is effected in the human organism by means of the saliva and the gastric juice, is thus already brought about in the malted grain or malted grain bread to a great extent owing to the action of the diastase, and the work which the human digestive organs are thus saved explains the great digestibility of malted grain bread as found by competent authorities on the subject and also by many persons of weak digestion.

With bread made from flour, groat or Graham (wheaten groat) bread such a process or diastase action cannot of course take place, as in milling the germ or embyo of the grain is destroyed.

The extreme sensitiveness of corn is shewn by the fact that broken, crushed or even hulled grain will not germinate when brought in contact with moisture but gradually rots. For this reason bread made from grain the husks of which have been removed cannot claim to have more free nutriment than the ordinary bread made from flour, and in no case does it possess anything like the valuable properties of malted grain bread.

From the formation of sugar above referred to arises the greater capacity for holding moisture and retaining it for a long period possessed by bread made in accordance with this improved process. Sugar is known to be a hygroscopic body, combining with water with far greater energy than does starch-flour. If, for example, like quantities of sugar and starch are mixed with like quantities of water, both mixtures being exposed to the air under similar conditions, then the starch will become dry comparatively quickly whilst the sugar will not again become entirely dry. This is exactly what takes place with bread; a bread which is rich in sugar, such as malted grain bread, possesses greater moisture than other bread, without appearing to be in any way damp, and retains this moisture for a very long time, whilst bread made with flour being poor in sugar, necessarily becomes dry in a very short time. Bread made from flour if it had as much capacity for holding moisture as malted grain bread, would appear to be quite wet and unpalatable, as water does not combine closely with starch.

A further property of malted grain bread, that of becoming mouldy only long after bread made from flour, is the natural consequence of the special method of manufacture. The explanation of this is essentially to be found in the preserving qualities of the sugar and not in the unessential removal of substances producing mould and putrefaction by wet cleaning the grain.

The best manner of carrying out the manufacture of malted grain bread directly from the grain is as follows:

Good grain capable of germination is, after undergoing a dry cleaning, carefully washed in a suitable washing machine and freed from all dirt, refuse, weeds, injurious fungi and the like. It then passes into a receptacle in which is introduced at the proper temperature and for a suitable period, moisture sufficient to penetrate to the inmost core of the grain and cause stimulation of diastase and production of germination, and also for the subsequent preparation of dough or bread. The moisture may be introduced and the swelling of the grain be effected not only by means of water, but also by steam and, if desired by milk or the like, but it is necessary that the proper temperature should be maintained

whilst this is taking place. The surface of the grain where broken appear quite shiny, but care should be taken that this point is not exceeded, as when this operation is carried on too long an excessively wet dough results. The temperature should also be kept within certain limits. With too great a heat the germinating capacity of the grain is destroyed and the germ killed, whilst with too low a temperature the operation occupies such a length of time that there is danger of producing mould and lactic acid.

As soon as the moisture has penetrated to the inmost core of the grain, the latter passes to a suitable receptacle for the purpose of being cooled and freed from the water which is still present, and in this receptacle the germination [redacted] carried on to the [redacted] by reducing the [redacted] obtained by mechanical means whereby the germ is destroyed.

Owing to the intimate grinding of the malted grain in an appropriate reducing machine or mill to a fine dough suitable for baking an increased action of the diastase takes place, which action can continue in the dough so formed and give rise to further convertible products.

The further treatment of the dough by the addition of leaven, yeast or the like, and also the kneading and rising or working and finally the baking of the bread, are carried out in a similar manner to that employed for bread made from flour or groats.

Bread made in this manner may truly be termed "Malted grain bread," it has an agreeable aromatic taste, is absolutely pure and free from all foreign substances, is nutritious and easy of digestion, will keep fresh and sweet for a week, and finally is cheaper than bread of other kinds owing to the manner in which it is manufactured.

It will of course be understood that the processes above described may be applied equally well to all grain and products capable of germination and, in addition to the preparation of dough and bread for human food, to the preparation of food for cattle.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, as communicated to me by my foreign correspondents, I declare that what I claim is:—

A process for the manufacture of dough from grain capable of germination without hulling or milling in which, the germinating power of the grain is utilised for the production of diastase for making bread by calling the grain to life by treating it with moisture at a temperature suitable for causing germination which therefore results and a malting process is occasioned, whereupon the malted grain so obtained is converted or worked into dough suitable for baking by means of reducing or grinding machinery.

Dated this 5th day of August 1897.

HASELTINE, LAKE & Co.,
45 Southampton Buildings, London, W.C., Agents for the Applicants.

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